AMENDMENTS TO THE CLAIMS:

Please amend the Claims as follows:

1. (Currently Amended) A plasma processing apparatus for processing an object using a plasma, comprising:

a processing chamber defining a processing cavity for containing an object to be processed and a process gas therein;

a microwave radiating antenna having a microwave radiating surface for radiating a microwave in order to excite a plasma in the processing cavity; and

a dielectric body provided so as to be opposed to the microwave radiating surface;

wherein no additional microwave radiating antenna is placed between the microwave radiating antenna and the dielectric body;

wherein a distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is represented with a wavelength of the microwave being a distance unit, is determined to be in a range satisfying an inequality

$0.7 \times n/4 \leq D \leq 1.3 \times n/4$ (n being a natural number);

whereby a standing wave of the microwave is formed between the microwave radiating surface and a plasma exciting surface, thereby exciting a plasma at the plasma exciting surface by being supplied with energy from the standing wave of the microwave, the plasma exciting surface substantially coinciding with the surface of the dielectric body facing away from the microwave radiating surface, the plasma being formed between the

plasma exciting surface and the object to be processed, the standing wave not entering the plasma,

wherein one end of the standing wave is positioned on the plasma exciting surface.

2. (Currently Amended) A plasma processing apparatus for processing an object using a plasma, comprising:

a process chamber defining a processing cavity for containing an object to be processed and a process gas therein;

a microwave radiating antenna having a microwave radiating surface for radiating a microwave in order to excite a plasma in the processing cavity; and

a dielectric body provided so as to be opposed to the microwave radiating surface;

wherein no additional microwave radiating antenna is located between the microwave radiating antenna and the dielectric body;

wherein a distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is represented with a wavelength of the microwave being a distance unit, is determined to be in a range satisfying an inequality

$0.7 \times n/2 \leq D \leq 1.3 \times n/2$ (n being a natural number);

whereby a standing wave of the microwave is formed between the microwave radiating surface and a plasma exciting surface, thereby exciting a plasma at the plasma

exciting surface by being supplied with energy from the standing wave of the microwave, the plasma exciting surface substantially coinciding with the surface of the dielectric body facing away from the microwave radiating surface, the plasma being formed between the plasma exciting surface and the object to be processed, the standing wave not entering the plasma,

wherein one end of the standing wave is positioned on the plasma exciting surface.

3. (Previously Presented) The plasma processing apparatus as claimed in claim 1, in which the dielectric body is a plate-shaped member disposed in such a manner that a distance between the dielectric plate and the plasma radiating surface is substantially zero, and a thickness d of the dielectric plate represented with the wavelength of the microwave being a distance unit is determined to be in a range satisfying an inequality

$0.7 \times n/4 \leq d \leq 1.3 \times n/4$ (n being a natural number).

4. (Currently Amended) The plasma processing apparatus as claimed in claim 2, in which the dielectric body is a plate-shaped member disposed in such a manner that a distance between the dielectric plate and the plasma radiating surface is substantially zero, and a thickness d <u>of the dielectric plate represented with the wavelength of the microwave being a distance unit</u> is determined to be in a range satisfying an inequality

$0.7 \times n/2 \leq d \leq 1.3 \times n/2$ (n being a natural number).

5. (Previously Presented) The plasma processing apparatus as claimed in claim 1, in which

the microwave radiating antenna is a radial line slot antenna having a number of slots formed and distributed in the microwave radiating surface thereof for radiating the microwave.

6. (Previously Presented) The plasma processing apparatus according to claim 1, wherein the microwave radiating antenna is a radial line slot antenna having a number of slots formed and distributed in the microwave radiating surface thereof for radiating the microwave, the number of the slots being concentrically arranged in the microwave radiating surface; and

wherein one per six or three slots in the peripheral direction of the slots arranged in the outermost peripheral part are closed so as to uniformize, in a plane, the plasma generated in the processing cavity.

7. (Currently Amended) A plasma processing method for processing an object using a plasma, the method comprising the steps of:

putting an object to be processed and a process gas into a processing cavity defined in a processing chamber;

radiating a microwave for exciting a plasma from a microwave radiating antenna having a microwave radiating surface to the processing cavity;

providing a dielectric body so as to be opposed to the microwave radiating surface; and

determining a distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is represented with a wavelength of the microwave being a distance unit, to be in a range satisfying an inequality

$0.7 \times n/4 \leq D \leq 1.3 \times n/4$ (n being a natural number),

whereby a standing wave of the microwave is formed between the microwave radiating surface and a plasma exciting surface, thereby exciting a plasma at the plasma exciting surface by being supplied with energy from the standing wave of the microwave, the plasma exciting surface substantially coinciding with the surface of the dielectric body facing away from the microwave radiating surface, the plasma being formed between the plasma exciting surface and the object to be processed, the standing wave not entering the plasma,

wherein one end of the standing wave is positioned on the plasma exciting surface, and

wherein no additional microwave radiating antenna is located between the microwave radiating antenna and the dielectric body.

8. (Currently Amended) A plasma processing method for processing an object using a plasma, the method comprising the steps of:

putting an object to be processed and a process gas into a processing cavity defined in a processing chamber;

radiating a microwave for exciting a plasma from a microwave radiating antenna having a microwave radiating surface to the processing cavity;

providing a dielectric body so as to be opposed to the microwave radiating surface; and

determining a distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is represented with a wavelength of the microwave being a distance unit, to be in a range satisfying an inequality

$0.7 \times n/2 \leq D \leq 1.3 \times n/2$ (n being a natural number),

whereby a standing wave of the microwave is formed between the microwave radiating surface and a plasma exciting surface, thereby exciting a plasma at the plasma exciting surface by being supplied with energy from the standing wave of the microwave, the plasma exciting surface substantially coinciding with the surface of the dielectric body facing away from the microwave radiating surface, the plasma being formed between the plasma exciting surface and the object to be processed, the standing wave not entering the plasma,

wherein one end of the standing wave is positioned on the plasma exciting surface, and

wherein no additional microwave radiating antenna is located between the microwave radiating antenna and the dielectric body.

9. (Previously Presented) The plasma processing apparatus as claimed in claim 5, in which

a part of the number of slots is closed so as to uniformize, in a plane, the plasma generated in the processing cavity.

10-11. (Cancelled)

12. (Previously Presented) The plasma processing method as claimed in claim 7, in which

the microwave radiating antenna is a radial line slot antenna having a number of slots formed and distributed in the microwave radiating surface thereof for radiating the micro

13. (Previously Presented) The plasma processing method as claimed in claim 12, further comprising:

a step of closing a part of the number of slots so as to uniformize, in a plane, the plasma generated in the processing cavity.

14. (Previously Presented) The plasma processing method as claimed in claim 13, wherein the number of the slots are concentrically arranged in the microwave radiating surface; and

wherein the step of closing the slots includes the step of closing one per six or three slots in the peripheral direction of the slots arranged in the outermost peripheral part.

15. (Cancelled)

16. (Currently Amended) A plasma processing apparatus for processing an object using a plasma, comprising:

a processing chamber defining a processing cavity for containing an object to be processed and a process gas therein;

a microwave radiating antenna having a microwave radiating surface for radiating a microwave in order to excite a plasma in the processing cavity, the microwave radiating antenna being a radial line slot antenna having a number of slots formed and distributed in the microwave radiating surface; and

a dielectric body provided so as to be opposed to the microwave radiating surface,

wherein no additional microwave radiating antenna is located between the microwave radiating antenna and the dielectric body;

wherein a distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is represented with a wavelength of the microwave being a distance unit, is determined to be in a range satisfying an inequality

$0.7 \times n/4 \leq D \leq 1.3 \times n/4$ (n being a natural number),

wherein one end of the standing wave is positioned on the plasma exciting surface.

17. (Currently Amended) A plasma processing apparatus for processing an object using a plasma, comprising:

a processing chamber defining a processing cavity for containing an object to be processed and a process gas therein;

a microwave radiating antenna having a microwave radiating surface for radiating a microwave in order to excite a plasma in the processing cavity, the microwave radiating antenna being a radial line slot antenna having a number of slots formed and distributed in the microwave radiating surface; and

a dielectric body provided so as to be opposed to the microwave radiating surface,

<u>wherein no additional microwave radiating antenna is located between the microwave radiating antenna and the dielectric body;</u>

wherein a distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is represented with a wavelength of the microwave being a distance unit, is determined to be in a range satisfying an inequality

$0.7 \times n/2 \leq D \leq 1.3 \times n/2$ (n being a natural number),

wherein one end of the standing wave is positioned on the plasma exciting surface.

18. (Previously Presented) The plasma processing apparatus as claimed in claim 16, in which the dielectric body is a plate-shaped member disposed in such a manner that a distance between the dielectric plate and the plasma radiating surface is substantially zero, and a thickness d of the dielectric plate represented with the wavelength of the microwave being a distance unit is determined to be in a range satisfying an inequality

$0.7 \times n/4 \leq d \leq 1.3 \times n/4$ (n being a natural number).

19. (Currently Amended) The plasma processing apparatus as claimed in claim 17, in which the dielectric body is a plate-shaped member disposed in such a manner that a distance between the dielectric plate and the plasma radiating surface is substantially zero, and a thickness d of the dielectric plate represented with the wavelength of the microwave being a distance unit is determined to be in a range satisfying an inequality

$0.7 \times n/2 \leq d \leq 1.3 \times n/2$ (n being a natural number).

20. (Previously Presented) The plasma processing apparatus according to claim 16, in which a part of the number of slots is closed so as to unifomize, in a plane, the plasma generated in the processing cavity.

21. (Previously Presented) The plasma processing apparatus according to claim 16, in which the number of the slots are concentrically arranged in the microwave radiating surface.

22. (Previously Presented) The plasma processing apparatus according to claim 21, wherein one per six or three slots in the peripheral direction of the slots arranged in the outermost peripheral part are closed so as to uniformize, in a plane, the plasma generated in the processing cavity.

23. (Currently Amended) A plasma processing method for processing an object using a plasma, the method comprising the steps of:

putting an object to be processed and a process gas into a processing cavity defined in a processing chamber;

radiating a microwave for exciting a plasma from a microwave radiating antenna having a microwave radiating surface to the processing cavity, the microwave radiating antenna being a radial line slot antenna having a number of slots formed and distributed in the microwave radiating surface;

providing a dielectric body so as to be opposed to the microwave radiating surface; and

determining a distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is

represented with a wavelength of the microwave being a distance unit, to be in a range satisfying an inequality

$0.7 \times n/4 \leq D \leq 1.3 \times n/4$ (n being a natural number),

wherein one end of the standing wave is positioned on the plasma exciting surface, and

wherein no additional microwave radiating antenna is placed between the microwave radiating antenna and the dielectric body.

24. (Currently Amended) A plasma processing method for processing an object using a plasma, comprising the steps of:

putting an object to be processed and a process gas into a processing cavity defined in a processing chamber;

radiating a microwave for exciting a plasma from a microwave radiating antenna having a microwave radiating surface to the processing cavity, the microwave radiating antenna being a radial line slot antenna having a number of slots formed and distributed in the microwave radiating surface;

providing a dielectric body so as to be opposed to the microwave radiating surface; and

determining a distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is represented with a wavelength of the microwave being a distance unit, to be in a range satisfying an inequality

$0.7 \times n/2 \leq D \leq 1.3 \times n/2$ (n being a natural number),

wherein one end of the standing wave is positioned on the plasma exciting surface, and

wherein no additional microwave radiating antenna is placed between the microwave radiating antenna and the dielectric body.

25. (Previously Presented) The plasma processing method as claimed in claim 23, further comprising:

a step of closing a part of the number of slots so as to uniformize, in a plane, the plasma generated in the processing cavity.

26. (Previously Presented) The plasma processing method as claimed in claim 25, wherein the number of the slots are concentrically arranged in the microwave radiating surface; and

wherein the step of closing the slots includes the step of closing one per six or three slots in the peripheral direction of the slots arranged in the outermost peripheral part.